Serial No.: 10/728,705
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Amendment dated October 20, 2006
Responsive to Office Action of July 20, 2006

I. CLAIM LISTING

The following listing of claims replaces the pending claims.

1. (Original): A method for determining a parameter proportional to the cardiac stroke volume of a subject comprising:

sensing an input signal that is proportional to arterial blood pressure;

calculating the standard deviation of the input signal over a measurement interval; and

calculating an estimate of the cardiac stroke volume as a function of the standard deviation of the input signal.

2. (Original): A method as in claim 1, further comprising:

measuring the heart rate of the subject; and

estimating current cardiac output of the subject by calculating the product of the heart rate and the standard deviation and scaling the product by a calibration constant.

3. (Original): A method as in claim 2, further comprising:

measuring a calibration cardiac output value; and

calculating the calibration constant as the quotient between a calibration cardiac output estimate and the product of the heart rate and the standard deviation.

4. (Original): A method as in claim 1, further comprising sensing the input signal non-invasively.

5. (Original): A method as in claim 1, in which the measurement interval extends over more than one cardiac cycle.

6. (Original): A method as in claim 5, in which the measurement interval is a plurality of cardiac cycles.

7. (Original): A method as in claim 5, further comprising:

calculating a component standard deviation value of the input signal for each of a plurality of measurement intervals;

computing a composite standard deviation value as an average of the component standard deviation values; and

using the composite standard deviation value in calculating the estimate of the cardiac stroke volume.

8. (Original): A method as in claim 5, further comprising:

for each of a plurality of cardiac cycles, calculating a mean pressure value; and adjusting the measurement interval as a function of change in the mean pressure value.

9. (Original): A method as in claim 5, further comprising high-pass filtering the input signal before the step of calculating the standard deviation.

10.(Original): A method as in claim 1, in which the input signal is a measurement of the arterial blood pressure.

11. (Original): A method as in claim 10, further comprising:

determining a maximum value and a minimum value of the arterial blood pressure; and

calculating the standard deviation as a function of the difference between the maximum and minimum values.

12. (Original): A method as in claim 1, in which the step of calculating the estimate of the cardiac stroke volume as a function of the standard deviation of the input signal comprises calculating the product of the standard deviation and a calibration factor

13.(Original): A method for determining cardiac stroke volume of a subject comprising:

sensing arterial blood pressure;

converting the sensed arterial blood pressure to a pressure signal;

calculating the standard deviation of the pressure signal over a measurement interval;

calculating an estimate of the stroke volume as a function of the standard deviation of the pressure signal.

14. (Original): A method as in claim 13, further comprising:

measuring the heart rate of the subject; and

estimating current cardiac output of the subject by calculating the product of the heart rate and the standard deviation and scaling the product by a calibration constant.

15. (Original): A method as in claim 14, further comprising:

measuring a calibration cardiac output value; and

calculating the calibration constant as the quotient between a calibration cardiac output estimate and the product of the heart rate and the standard deviation.

16. (Orginal): A method for estimating cardiac output of a subject comprising:

sensing arterial blood pressure;

converting the sensed arterial blood pressure to a pressure signal;

calculating the standard deviation of the pressure signal over a measurement interval;

calculating an estimate of stroke volume as a function of the standard deviation of the pressure signal;

measuring the heart rate of the subject; and

estimating current cardiac output of the subject by calculating the product of the heart rate and the standard deviation and scaling the product by a calibration constant.

17. (Original): A system for determining a parameter proportional to the cardiac stroke volume of a subject comprising:

a sensor located in or on the body of the subject and generating a sensor signal that is proportional to arterial blood pressure;

conversion circuitry that receives the sensor signal and converts it to an input signal;

a processing system that receives the input signal and that includes processing modules for calculating the standard deviation of the input signal over a measurement interval and for calculating an estimate of the cardiac stroke volume as a function of the standard deviation of the input signal; and

a display for presenting the estimate of the cardiac stroke volume to a user.

18. (Original): A system as in claim 17, further comprising a heart rate monitor measuring the heart rate of the subject;

the processing system estimating current cardiac output of the subject by calculating the product of the heart rate and the standard deviation and scaling the product by a calibration constant.

19. (Original): A system as in claim 17, further comprising a high pass filter connected between the sensor and the processing system.

20. (Original): A system as in claim 17, in which the sensor is a direct blood pressure sensor.

21. (Original): A system for determining a parameter proportional to the cardiac stroke volume of a subject comprising:

a sensor located in or on the body of the subject and generating a sensor signal that is proportional to arterial blood pressure;

conversion circuitry that receives the sensor signal and converts it to an input signal;

a processing system including computer-executable code for calculating the standard deviation of the input signal over a measurement interval; and for calculating an estimate of the cardiac stroke volume as a function of the standard deviation of the input signal; and

a display for presenting the estimate of the cardiac stroke volume to a user.

22. (Original): A system as in claim 21, further comprising a heart rate monitor measuring the heart rate of the subject, the processing system further including computer-executable code for estimating current cardiac output of the subject by calculating the product of the heart rate and the standard deviation and scaling the product by a calibration constant.

23. (Original): A system as in claim 22, further comprising a calibration system measuring a calibration cardiac output value, the processing system further including computer-executable code for calculating the calibration constant as the quotient between a calibration cardiac output estimate and the product of the heart rate and the standard deviation.

24. (Original): A system as in claim 1, in which the sensor is non-invasive.

25. (Cancelled)